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SOME BIRDS AND MAMMALS

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WHICH DESTROY FISH AND GAME.

BY

DR. B. H. WARREN, STATE ZOOLOGIST.

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BARRED OWL.

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SOME BIRDS AND MAMMALS WHICH DESTROY FISH AND GAME

By B. H. WARREN, State Zoologist.

As many of our citizens, particularly fishermen, seem to labor under the impression that the damage annually done to fish by different kinds of birds and mammals is of a serious character, the writer has during the last three years been collecting all reliable data possible on the subject.

Some time ago the Department of Agriculture distributed throughout the State a circular asking for information as to the damage done by the fish-destroying birds and mammals. In response to these circulars several hundred answers were received and from them, it is found that the injury, contrary to prevalent impression, is not of a very serious nature. In fact, from our investigations, the mink and kingfisher, both of which are quite plentiful, in suitable localities, throughout the State, may be said to be about the only ones which commit very noticeable depredations to the finny inhabitants of our streams and ponds. The otter, it is true, subsists principally on the fish diet, but otters are so rare in this Commonwealth, that the mischief they do is but trifling. The herons, or at least certain species, no doubt destroy a large number of fish, but they also are so few in numbers that the loss annually from their presence, (and the same is true of loons, grebes and several other species of our feathered fishermen) is certainly not, nor do I believe it ever will be, a source of danger to the increase of the finny denizens of our waters. The illegal taking of fish in various ways practiced continually in Pennsylvania, by individuals who seem to have little or no regard for the statutes, which remain inoperative mainly because our law-makers do not make sufficient appropriations to enable the Board of Fish Commissioners to properly enforce the present laws, causes a hundred times over more loss every year than all the fish-eating birds and four-footed animals that have a permanent or temporary residence within the boundaries of our State.

BIRDS OF PREY.

Fully twenty different species of eagles, hawks and owls occur regularly in Pennsylvania. Some, such as the screech, barred and great horned owls and the red-tailed hawk, are with us during all

seasons, while others, for example the short-eared owl and fish hawk, are usually present only during a portion of the year.

Birds of prey subsist wholly on animal food. A few species are detrimental, as they live largely on poultry, game—both furred and feathered—and many kinds of small wild song birds; but other species of raptorial birds, which are common neither as residents or migrants, are mostly highly beneficial, as their food has been found, from careful investigations, to be made up mainly of destructive rodents, injurious beetles, grasshoppers, etc.

So far as the osprey or fish hawk and the bald eagle are concerned there, of course, is no doubt about their fish-eating propensities, but neither of these birds are sufficiently numerous in our State to commit depredations worthy of notice. Few birds have been studied by naturalists with more care than have the birds of prey. The post-mortem examinations of the viscera of hundreds of them, together with observations in the field, have clearly shown that certain species, other than the osprey and bald eagle, will sometimes catch and feed on fish.

CROWS AND BLACKBIRDS.

Investigations have proven that the common crow and his yellow-eyed relatives the crow blackbirds, both omnivorous in their habits, will occasionally repair to shallow waters and catch small fry, which they devour. As fishermen, however, neither of these species can be called experts, and the number of fish they catch is certainly not large.

THE GREBES.

Grebes may easily be recognized by the beautiful silvery-white plumage of the breast and abdomen, the paddle-like feet, which are not webbed like those of a loon or duck, and the rudimentary tail which consists of a small tuft of downy feathers.

Grebes, during the spring and autumn migrations, occur generally throughout the State, particularly about the larger streams, lakes and mill-ponds, and during mild winters birds of this family are often seen about rivers and large ponds in the southern portion of the Commonwealth.

Although these birds are usually observed singly or in pairs, occasionally a good-sized flock is to be found. In relation to the grebes in general it can be stated that unless flying they are almost always to be seen in the water. The several species of this family, owing to the posterior situation of their legs, move with considerable difficulty when on the ground, over which they go in a slow, floundering manner.

Grebes, like some other kinds of aquatic birds, when wounded, will conceal themselves in weeds and grasses, which grow so luxuriantly in their favorite watery retreats, where they will remain for a considerable period of time with only their slender, tapering bills above the water's surface. They swim and dive with the utmost facility; when swimming beneath the water's surface, either in quest of prey or to escape capture, it is said they use their wings in the same manner as when flying in the air. Their well known habit of diving when alarmed, and particularly when shot at, has won for them the common name of "Hell-divers."

The Grebe's nest consists of a thick, matted mass of vegetation, such as reeds, flags, grasses, etc. Sometimes the nest is built close to the water, but usually, according to Mr. Ridgway, it is to be found floating upon the surface of the water in grassy or sedgy ponds or marshes. The same authority describes the eggs as follows: "2-5, dull-white, bluish-white, or very pale bluish-green, usually stained more or less (often quite deeply) with light brown, by contact with decomposed vegetable matter." With the exception of the Pied-billed grebe representatives of this family occurring in Pennsylvania breed generally north of the United States. Grebes subsist on fish, frogs, various aquatic insects—especially beetles—and to a limited extent on different water plants.

They confer no special benefits, nor are they in any particular detrimental to agricultural interests. Their flesh, quite tough, and disagreeable to the taste, is seldom eaten; the feathers, however, are considerably used by milliners, and by furriers for muffs, etc. For these purposes the silvery-white plumage of the breast and abdomen is taken.

During the past three years the writer has examined the stomach contents of twenty-seven grebes and found that eight of this number had in their food receptacles the remains of fish with the other food materials previously indicated.

THE LOONS.

Loons live almost habitually in the water; they dive with wonderful rapidity and skill, and are also remarkable for their ability to swim long distances under the water, especially when endeavoring to elude their enemies. As divers they are the most expert of all birds. They retire during the summer season to high boreal regions to rear their young, and as cold weather advances migrate southward. During migrations loons are most numerous about our seacoasts and on the large lakes in the interior.

Like the grebes, they move over the ground in a slow, floundering and awkward manner; their flight, however, is rapid, and when

migrating they generally fly at a considerable elevation. The shrill and mournful notes of these birds can be heard at a great distance; it is asserted by some that loons, like cuckoos, are more frequently heard before a storm than at other times.

The flesh of these birds is tough, dark-colored and "fishy." The white plumage of the under parts and the spotted feathers of the back are sometimes used by milliners and furriers.

The nest is described as a rudely built structure of reeds, grasses, etc., built on the ground near the water; the dark-colored and spotted eggs are said to be usually two in number. Bill long, hard, straight, tapering and sharp-pointed, being quite spear-like in appearance and well adapted to catching their prey, consisting principally of fish.

Two species of this family, namely, the Common Loon and the Red-throated Loon are found in Pennsylvania. It is claimed by some writers that in former years the Common Loon or Great Northern Diver, was a regular breeder about several of the lakes in the northeastern counties of Pennsylvania.

The stomachs of sixteen loons (three of which were the Red-throated), showed that thirteen had remains of fish in them, two contained seeds and other vegetable matter and the remaining one was empty. Fall fish, suckers, catfish, carp and also a brook trout seven inches long have been found in the stomachs of loons taken in this State.

THE DUCKS, ETC.

The ducks, geese and swans, according to Dr Coues (Key to N. A. birds) are represented by nearly one hundred and seventy-five species, inhabiting all parts of the world. Of this large number there are probably about fifty kinds which occur regularly in different parts of the United States, as residents or during migrations. In Pennsylvania nearly twenty species are found during the spring and fall migrations and in winter. But few species are now known to breed regularly in this State; in fact, the Wood Duck, it seems, is the only one that may be said to be at all common and fairly well distributed (in the wooded and thinly populated districts chiefly) as a breeder. Several species are also found in different sections of the State as rare and irregular visitants, and occasionally a few others, which have wandered considerably from their common range, are captured here. The Canada Goose, the Mergansers, the Wood, Ruddy and Ruffle-head ducks, and some few other kinds are met with quite frequently about the rivers, creeks, lakes and numerous ponds in nearly all parts of the State. The great majority of the members of this important family which visit here are, however, found mainly on the large rivers—especially the Susquehanna—and about the shores of Lake Erie. The best locations for duck shooting in this

State are at different points on the Susquehanna, from Harrisburg southward, and at Erie bay, where several species are quite numerous every year during the regular migrations. "It is not easy to overrate the economic importance of this large family. It is true that Mergansers, some of the sea ducks and certain maritime geese that feed chiefly upon animal substances, are scarcely fit for food, but the great majority afford a bounteous supply of sapid meat—a chief dependence, indeed, with the population of some inhospitable regions. Such is the case, for example, in the boreal parts of this continent, whither vast bands of water-fowls resort to breed during the fleeting Arctic summer. Their coming marks a season of comparative plenty in places where hunger often pinches the belly and their warm downy covering is patched into garments almost cold-proof.

"The general traits of the anserine birds are too well known to require more than passing notice. They are salacious to a degree, remarkable even in the hot blooded, passionate class of birds; a circumstance rendering the production of hybrids frequent and favoring the study of this subject. If we recall the peculiar actions of geese nipping herbage, and of ducks 'dabbling' in the water, and know that some species, as the Mergansers, pursue fish and other live prey under water, we have the principal modes of feeding. Nidification is usually on the ground, sometimes in a hollow tree; the nest is often warmly lined with live feathers; the eggs are usually of some plain color, as greenish, drab, or creamy; the clutch varies in number; commonly ranges from half a dozen to a dozen and a half. The young are clothed in a stiffish down, and swim at once. Among the ducks and Mergansers marked sexual diversity in color is the rule; the reverse is the case with swans and geese. A note-worthy coloration of many species, especially of ducks, is the speculum—a brightly colored, generally iridescent area on the secondary quills. Most of the species are migratory, particularly those of the northern hemisphere; the flight is performed in bands, that seem to preserve discipline as well as companionship, and with such regularity that no birds are better entitled to the claim of weather prophets."

The Mergansers, or Fishing Ducks, are probably the most common of all "wild ducks" about our smaller streams and ponds during the winter season.

Mergansers can easily be recognized by the bill, which is long (two inches or more in length), hooked, almost cylindrical, quite slender and furnished with saw-like teeth.

Like the Loons, Cormorants, etc., these birds, when swimming under the water, employ their wings in the same manner as when flying in the air. They subsist almost exclusively on fish; their

flesh is dark-colored, quite tough and unpalatable. Three species of this sub-family are found in the United States, and all occur in Pennsylvania.

THE HERONS ETC.

Birds of this family, containing, it is said, about seventy-five species are very generally dispersed throughout all parts of the globe. A few species wander to cold countries, but the great majority of these waders inhabit the lower temperate and tropical regions. In different localities throughout the United States, about fifteen species and varieties (local or geographical races) are recorded by modern writers; of these nine species have been taken, during recent years, in Pennsylvania.

Some species occur with us as regular summer residents, while others are observed here only as transitory visitors in the spring and fall migrations. These birds frequent muddy banks, rivers, creeks, lakes and ponds; they are also found about swampy meadows and marshy places, particularly if the latter are well supplied with pools of shallow water, protected by trees and bushes. They often remain quiet or inactive in daytime, but as evening approaches, or in the night, they go out, like the owls, in quest of food, which is secured by rapid, dextrous thrusts of their long spear-like bills.

Birds of this group subsist chiefly on various kinds of fishes (fish measuring nearly a foot in length are often swallowed by large herons), frogs and snakes; and they also eat other kind of animal food, such as large insects, field mice, lizards, cray-fish, leeches, etc., and some of the larger herons occasionally catch wood-rats and young birds of other species which breed about their favorite feeding resorts. With the exception of the Bitterns, these birds are gregarious, particularly when breeding, and in the Southern States heron and egrets are abundant; they often breed together in great numbers, frequently in company with cormorants, water turkeys and ibises. The herons and egrets build rude and bulky nests of sticks and twigs, in trees and bushes; the bluish or greenish colored and unspotted eggs vary from two to six in number.

The sharp, rasping cries of these birds are often uttered when feeding, also if they are frightened, and frequently when flying, either when migrating or when going to and from their feeding places. Birds of this family are known by the following characters: Long necks and legs; bill long, straight, tapering, acute and furnished with sharp cutting edges. Lores naked and usually, particularly in the breeding season, bright colored; the head is rather long, narrow and flat on the sides. When breeding these birds frequently have the back of the head, the lower neck, back or scapulars, beautifully ornamented with long plumes. Herons and egrets have three

pairs of powder-down tracts, one on lower part of back, the second on lower belly, and a third on breast. Bitterns have two pairs of these tracts, one on lower back, the other on breast; toes long and slender; the claws are long and curved, especially that of hind toe, and the middle claw has a fine comb or inner edge. The hind toe is inserted on a level with them in front; outer toes usually connected with middle by a small web at base, others free. Tail very short. twelve feathers, except in bitterns, which have only ten.

KINGFISHERS.

Two species of Kingfishers are found in North America. Of these but one—the Belted—occurs in Pennsylvania. The Kingfisher family, however, is not a small one, as species are present in nearly all parts of the world; but they are most abundant in warm countries. Dr Coues says: “One would gain an imperfect or erroneous idea of the family to judge it by the American fragment of one genus and six or eight species. * * * There are in all 125 species, belonging to nineteen genera; the latter appear to be very judiciously handled, but a moderate reduction of the former will be required. They are very unequally distributed. *Ceryle* alone is nearly cosmopolitan, absent only from the Australian region; the northern portion of the Old World has only two peculiar species; three genera and twenty-four species are characteristic of the Ethiopian region; one genus and twenty-five species are confined to India; while no less than ten genera and fifty-nine species are peculiar to Australia.”

The Kingfisher family is divided into two sub-families, one of which is chiefly insectivorous and the members of which generally nest in holes in trees sometimes at a considerable distance from water, while the other section of this family subsist almost entirely on fish and deposit their eggs and rear their young usually in holes in banks along or near the streams or other bodies of water where they catch their finny prey.

Kingfishers are shy and solitary birds, they, or at least the species found in this region, feed almost wholly on small fish, but occasionally a few aquatic insects or small mammals, such as mice, are, by way of variety, devoured by them. When watching for food they sit motionless when perched on a stake, old stump, or bough hanging over the water.

When their prey is sighted they dart after it and seize it with the bill when on the wing. The fish or other food is swallowed whole, when they return to the watching post.

“Kingfishers (says Mr. Gmelin) are seen all over Siberia; and their feathers are employed by the Tartars and the Ostiaes for many superstitious uses. The former pluck them, cast them into the water and carefully preserve such as float, and they pretend that if

with one of these feathers they touch a woman, or even her clothes, she must fall in love with them. The Ostiaks take the skin, the bill, and the claws of this bird, and shut them in a purse; and as long as they preserve this sort of amulet, they believe they have no ill to fear. The person who taught me this means of living happy, could not forbear shedding tears; he told me that the loss of a kingfisher's skin that he had, caused him to lose also his wife and his goods. I observed that such a bird could not be very rare, since a countryman had brought me one, with its skin and feathers; he was much surprised, and said that if he had the luck to find one, he would give it to no person."

FISH HAWK OR OSPREY.

This species, although most numerous about the seacoast, is frequently to be found along our large rivers and many of our larger lakes. During the spring and autumn months these hawks, generally singly, but sometimes in pairs, if not disturbed, will linger for several days about mill dams and carp ponds where they can easily capture fish.

The fish hawk occurs in Pennsylvania only as a summer resident, arriving generally late in March and remaining until sometimes the middle of November.

The Fish Hawk commonly rears its young in the vicinity of the seacoast, yet it oftentimes is found breeding near the borders of large rivers or in the vicinity of large inland lakes. The nest, a very bulky structure (from four to eight feet in diameter) composed mainly of sticks, and lined with sea weeds, mosses, grasses, etc., is built usually on a large tree near the water. The eggs, two or three in number, measure about two and one-half inches in length by one and three-fourth inches in width; they are yellowish-white, thickly covered with large blotches of different shades of brown.

This hawk is a regular but by no means common breeder in Pennsylvania. The nest of this bird may be found almost every year along the Susquehanna river and about some of the larger lakes in the northeastern section of the State. The writer has examined the stomach-contents of twenty-three of these hawks captured in Pennsylvania, New Jersey, Maryland, Delaware and Florida, and found only the remains of different species of fish. It may be, as some writers assert, that the fish hawk when breeding subsists in part on reptiles and batrachians; however, my opinion is that these birds never touch other food unless they are unable to catch fish.

Hon. Hiram Peoples, of New Providence, Lancaster county, who devotes much attention to fish culture, raising large quantities of bass and goldfish for the markets, informs me he loses a great many fish through Fish Hawks. In fact, he says, the depredations of these

The Mink.





Black-crowned Night Heron.







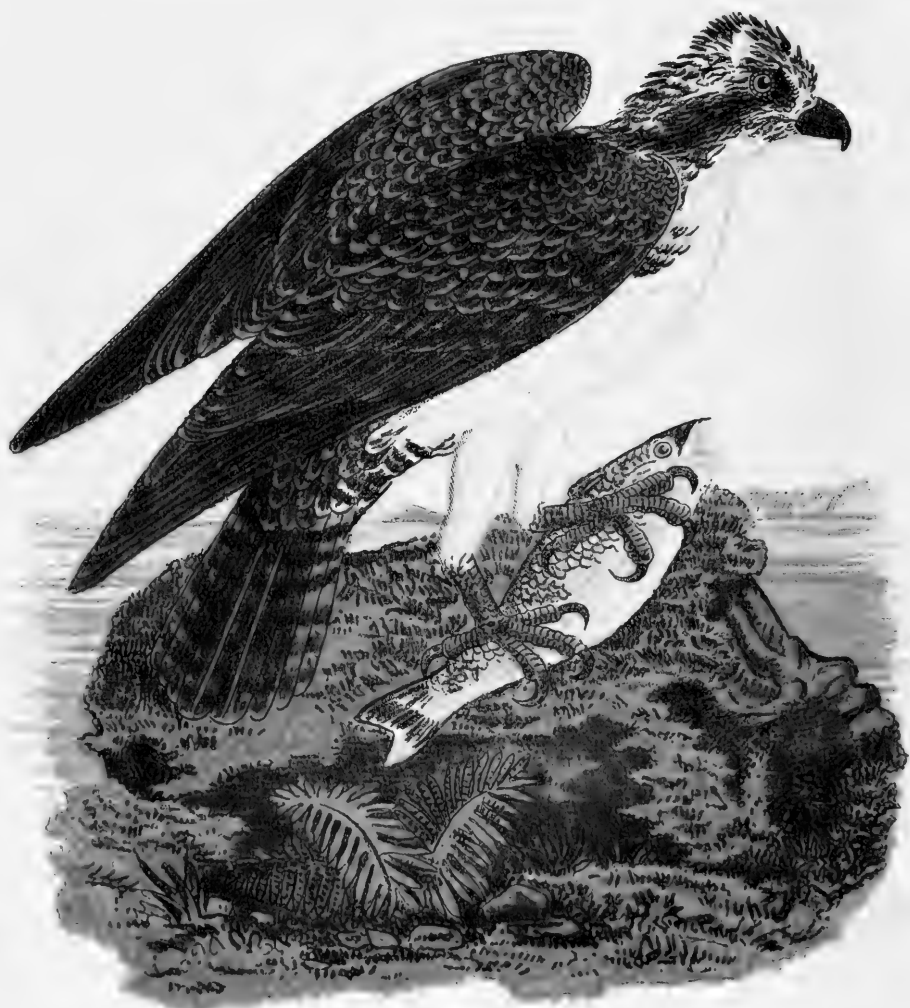
Belted Kingfisher.



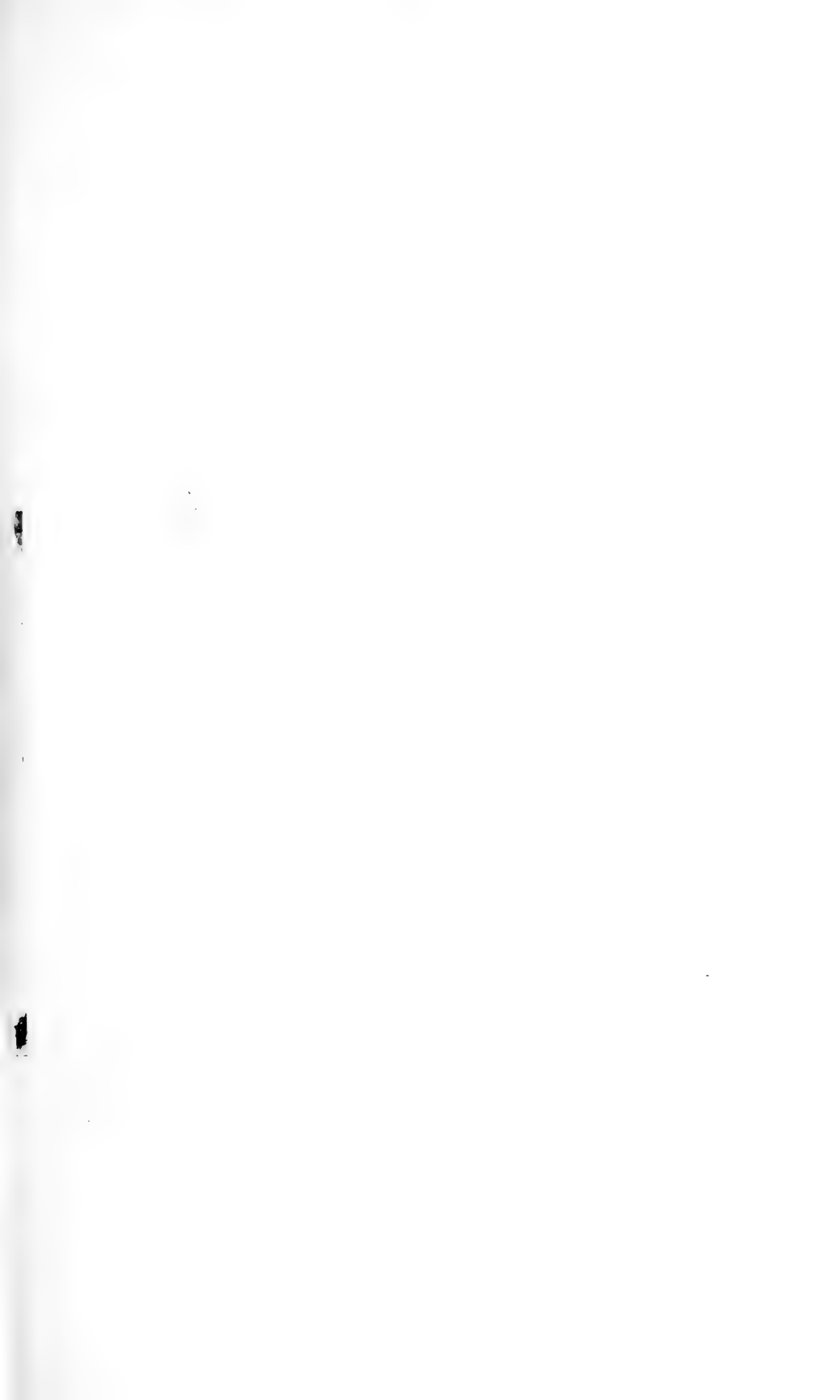
The Heron.



Hooded Merganser.



Fish Hawk.





BALD EAGLE.

hawks became so numerous that he offered a bounty of fifty cents each for every one which was killed on his premises. This bounty offer induced several neighbors' boys to make special efforts to destroy the feathered fishermen. Mr. Peoples states that a number of hawks have been killed and he has saved many dollars worth of fish.

The Osprey, as this hawk is often called, does not, as some farmers believe, disturb domestic fowls, nor does it molest game either furred or feathered. Small, wild song birds are likewise free from its attacks. Blackbirds as well as other species of the feathered kind have often been known to build their homes in the interstices of the bulky nest of the Fish Hawk.

BALD EAGLE.

The name "Bald" which is given to this species is not applied because the head is bare, but because the feathers of the neck and head in the adults are pure white. In Pennsylvania, as well as throughout the United States, we have but two species of eagles. The "Black," "Gray" and "Washington" eagles are all young of the Bald Eagle, our national emblem. Three years, it is stated, are required before this species assumes the adult plumage. The Bald Eagle is found in Pennsylvania at all seasons of the year.

The Nest and Eggs.

A few of these birds annually rear their young along the Susquehanna river and also in a few other localities in this State. The nest, a bulky affair, built usually on a large tree, mostly near the water, is about four or five feet in diameter. It is made up chiefly of large sticks, lined inside with grasses, leaves, etc. The eggs commonly 2—rarely 3—are white and they measure about 3 by 2½ inches. A favorite article of food with this bird is fish, which he obtains, mainly by strategy and rapine. Occasionally, however, according to different observers, the Bald Eagle will do his own fishing.

This species is quite plentiful in the vicinity of large rivers, bays, etc., where Fish Hawks are common. Although the Bald Eagle feeds to a considerable extent on fish he subsists largely on ducks, geese and other aquatic birds. Audubon, referring to this eagle says: "No sooner does the Fish Hawk make its appearance along our Atlantic shores, or ascend our numerous and large rivers, than the eagle follows it, and, like a selfish oppressor, robs it of the hard-earned fruits of its labor. Perched on some tall summit, in view of the ocean, or of some water-course, he watches every motion of the Fish Hawk while on wing. When the latter rises from the water, with a fish in its grasp, forth rushes the eagle in pursuit. He mounts above the Fish Hawk, and threatens it by actions well understood,

when the latter, fearing perhaps that its life is in danger, drops its prey. In an instant the eagle, accurately estimating the rapid descent of the fish, closes his wings, follows it with the swiftness of thought, and the next moment grasps it."

Occasionally Does His Own Fishing.

The Bald Eagle has been known to catch carp and suckers, and Audubon says: "This bird now and then procures fish for himself by pursuing them in the shallows of small creeks. I have witnessed several instances of this in the Perkiomen creek in Pennsylvania, where, in this manner, I saw one of them secure a number of red-fins, by wading briskly through the water, and striking at them with his bill."

How Eagles Capture Wild Fowl.

Dr. Wm. Brewster, writing of this species at Cobb's Island, Virginia, says: "In the winter the eagles are much more numerous than at any other time of the year, and my informant has, on several occasions, seen as many as eight at once. At this season the neighboring bays and creeks swarm with wild-fowl and upon these the eagles principally live. He has never known them to catch fish of any kind, although they not unfrequently rob the Fish Hawk.

"Geese and Brant form their favorite food, and the address displayed in their capture is very remarkable. The poor victim has apparently not the slightest chance for escape. The eagle's flight, ordinarily slow and somewhat heavy, becomes, in the excitement of pursuit, exceedingly swift and graceful, and the fugitive is quickly overtaken. When close upon its quarry the eagle suddenly sweeps beneath it, and turning back downwards, thrusts its powerful talons up into its breast. A brant or duck is carried off bodily to the nearest marsh or sand-bar, but a Canada Goose is too heavy to be thus easily disposed of. The two great birds fall together to the water beneath, while the eagle literally tows his prize along the surface until the shore is reached. In this way one has been known to drag a large goose for nearly half a mile."

Kills Poultry and Game.

The Bald Eagle occasionally devours young pigs, lambs, and fawns; domestic fowls, wild turkeys, hares, &c., are also destroyed by this species. I have knowledge of at least two of these birds which have killed poultry (tame ducks and turkeys) along the Susquehanna river. Sometimes like the Golden Eagle, this species will attack raccoons and skunks. I once found two or three spines of a porcupine in the body of an immature Bald Eagle.



GOLDEN EAGLE.

GOLDEN EAGLE.

The Golden Eagle occurs in this State as a winter visitor. The only species with which it is sometimes compared is the Bald Eagle in immature dress. The two birds, however, can be distinguished at a glance, if you remember that the Golden Eagle has the tarsus (shin) densely feathered to the toes, while on the other hand, the Bald Eagle has a bare shin. The Golden Eagle breeds in high mountainous regions and the Arctic countries.

There is a specimen of this species in the State Museum which was captured a few years ago in Clinton county, where for several days, when deep snow covered the ground, it lingered about a farm house and preyed upon chickens and turkeys, and when it was shot it had just swooped down on a favorite pussy which spent most of her time in a swampy, grassy thicket, near the barnyard, watching for small birds and rabbits.

Food of the Golden Eagle.

Golden Eagles are rather rare in this region, hence their depredations to poultry, game and live stock occasion comparatively little loss. Domestic fowls, ducks and turkeys especially are often devoured; different species of water birds, grouse, and wild turkeys, suffer chiefly among the game birds. Fawns are sometimes attacked and killed; occasionally it destroys young pigs, and frequently many lambs are carried off by this powerful bird. Rabbits are preyed upon to a considerable extent. To illustrate the damage which eagles sometimes do on sheep ranches, Dr. A. K. Fisher publishes the following letter, which fully explains how destructive eagles may occasionally become. This letter as Dr. Fisher observes, "may refer in part to the Bald Eagle."

Rhems, Georgetown County, S. C., May 30, 1889.

Col. Alex. Macbeth:

Dear Sir: Yours 22d instant at hand, and in reply will say that the eagles are more destructive to the sheep-growing industry in this section than dogs. On one ranch this spring one shepherd alone killed over forty himself, principally by using strychnine. They were worse than we ever knew before. We lost fully 400 or 500 lambs, as they devour them as fast as they drop from the old sheep. * * * We frequently see during eagle or lambing season, fifteen or twenty eagles in a covey (or bunch), which shows at a glance that they are very destructive. We have also a few wildcats that devour the young sheep, but can manage them better than eagles.

Yours very truly,

T. RHEM & SONS.

ADULT DEER ATTACKED.

Some years ago I saw the remains of a Golden Eagle hanging, with some pets, on a hunter's cabin in the wilds of Clinton county, Pa., and on making inquiry learned that the bird had been shot in

the act of attacking a small doe. Mr. C. F. Morrison, writing of a similar case which had been called to his attention says: "The bird had captured and killed a good-sized beach-tailed deer and was shot while sitting on its body" (O&O, Vol. xiv, 1889). Mr. Henry Seebolm, a European naturalist, writing of the species in the Old World, makes the following observation concerning its food: "The Golden Eagle has been known on one highland sheep farm alone, in the course of a single season, to carry off as many as thirty-five lambs.

* * * In deer forests, eagles are of the greatest service; for, although they sometimes take a sickly deer calf, they live almost entirely on blue hares, so troublesome to the deer stalker; and most certainly deer are better for the removal of the weak and sickly ones which would only possibly live to transmit their disease to posterity. * * * The Golden Eagle will eat carrion when pressed for food. * * * The Golden Eagle also preys upon various species of birds, notably the black cock and red grouse, star-migan, curlews and plovers."

RED SHOULDERED HAWK.

This species like the Red-tailed Hawk is known to farmers and sportsmen as "hen-hawk." This name, however, is very misleading as this bird seldom destroys the tenants of the poultry yard. The Red-shouldered Hawk preys to a very limited extent on fish; the damage he does to the finny tribes is not worthy of consideration. This hawk does not merit the ill-will of the sportsman, as he rarely preys on game. The examination of 220 stomachs of this species, made by Dr. A. K. Fisher, of the National Department of Agriculture, showed that only one contained the remains of a game bird, and but three contained poultry.

In winter these hawks frequent principally the large water courses, meadow lands, and the vicinity of ponds, and not unfrequently an individual of this species can be observed on its perch overlooking a spring-head.

The Nest and Eggs.

The Red-shouldered Hawk nests in trees, usually in April or May, in this locality. The eggs, two to four in number, are white and blotched with different shades of brown. The nest is composed of sticks, fine bark and other fibres.

Does Not Prey on Chickens.

Although this hawk is frequently charged with destroying fowls observation in the field and numerous dissections of the stomachs of this species do not by any means justify such a statement. My experience on this subject agrees in the main with that of Dr. A. K. Fisher, who says: "Some authors insist that the Red-shouldered



RED SHOULDERED HAWK.

Hawk is destructive to poultry, but the writer, in all his field experience, has never seen one attack a fowl, nor has he found the remains of one in the stomachs of those examined. In making this statement, he does not include poultry which is eaten in the form of offal, for in severe weather when the ground is covered with snow and when food is scarce, the Red-shouldered Hawk will devour dead chickens which have been thrown out from the yard, as well as other refuse found on compost heaps or in the vicinity of slaughter houses. At such times the writer has often captured specimens of this hawk, as well as of crows, blue jays, red and flying squirrels, in steel traps set near a piece of chicken, rabbit or beef fastened in a tree."

In my examinations of fifty-seven of these hawks which have been captured in Pennsylvania, forty-three showed field-mice, some few other small quadrupeds, grasshoppers and insects, mostly beetles; nine revealed frogs and insects; two, small birds, remains of small mammals and a few beetles; two, snakes and portions of frogs. In the stomachs of two of these hawks shot in Florida, I found, in one, portions of a small cat-fish, and in the other remains of a small mammal and some few coleopterous insects. A specimen taken last year in New York State had in its stomach the remains of a sucker and hair of a small mammal.

GOSHAWK.

The Goshawk is not common in this State. Usually this fierce, powerful and predatory bird confines himself to the mountainous and heavily wooded regions. It is rather exceptional for these birds to be found in the populous farming districts and when they are seen in such places it is generally during severe winters, when their favorite mountain retreats are visited by heavy falls of snow. The Goshawk is a regular breeder on North mountain, Sullivan county, Pa. I have seen birds of this species in Clinton and Centre counties of this State in June and July, hence am inclined to think they may also breed in these counties. Messrs. Otto and Herman Behr, of Lopez, Pa., have found, during the last five or six years, several nests of these hawks on North mountain. Within a radius of four or five miles of their home, at least three or four pairs of these birds have bred regularly for many years.

The Nest.

In the latter part of May of this present year Mr. Herman Behr found a nest of a Goshawk about three miles from his home; it contained three young birds. The nest was a very bulky structure, probably not less than three feet high by three feet in diameter, and made up almost entirely of sticks. It was built on a large beech tree.

GOSHAWKS AND WILD PIGEONS.

Mr. Behr informs me that some thirty-five years ago there was a wild pigeon roost or breeding ground fully seven miles square, on North mountain, which was annually resorted to by these birds every spring. On one occasion Mr. Behr counted forty-six pigeons' nests on a single beech tree. Wild pigeons, until within the last three years, bred regularly in small numbers on the North mountain. The last wild pigeons observed in that region by Messrs. Otto and Herman Behr were taken in the spring of 1893. The Goshawk, also the Cooper's and Sharp-shinned species, in common with the Great Horned and Barred owls, destroyed great numbers of pigeons. Of all these raptorial birds the cruel, daring and blood-thirsty Goshawk was by far the most persistent and destructive enemy to the pigeons.

The owls, like other nocturnal mauraders, such as the wild cat or bay lynx, the red fox, the mink and agile weasel, all preyed upon the pigeons. The weasels would frequently climb the tree to get the pigeons eggs and young, or often to capture the old birds when at rest. The other mammals previously mentioned depended, mostly, on catching squabs which fell from the nests.

What Goshawks Prey Upon.

The Goshawk feeds upon chickens, turkeys, ducks, grouse, quail, robins, hares and squirrels and other small rodents. Although at times this bird is very destructive to poultry the greater damage done by this species in this State appears to be to game, especially grouse.

The following paragraphs concerning this daring and destructive hawk are taken from Dr. A. K. Fisher's Report, Bulletin No. 3, entitled "The Hawks and Owls of the United States." This species is one of the most daring of all the hawks, and while in pursuit of its prey is apparently less concerned by the presence of man than any other. It will dart down unexpectedly at the very feet of the farmer and carry off a fowl. The following from the pen of the late Dr. William Wood gives evidence of its boldness:

The Destruction of Poultry.

"The Goshawk is the most daring and venturesome of any of our diurnal birds of prey. A farmer who resides a few miles from my office, wishing to perpetuate the old New England custom of having a chicken pie for Thanksgiving dinner, caught some fowls, took them to a log, severed the neck of one, and threw it down beside him. In an instant the Goshawk seized the struggling fowl, and, flying off some ten rods, alighted and commenced devouring his prey. The boldness of the attack so astonished the farmer that he looked on with blank amazement. Recovering from his surprise, he hastened



AMERICAN GOSHAWK.

into the house and brought out his gun, which secured him both the hawk and the fowl. Another instance of still greater daring occurred near East Windsor Hill, Connecticut. A Gosawk flew after a fowl near a dwelling house; the door being open, the hen flew inside; the hawk followed, and seized her in the room occupied by an old gentleman and his daughter. The old man hastened to the rescue, and struck the hawk with a cane before it released its grasp. The daughter caught the hawk as it attempted to fly out of the door, and killed it." (Amer. Nat. Vol. X. 1876, p. 134.)

Capt. Charles E. Bendire informed the writer that at Fort Klamath, Oregon, he once shot at a Goshawk and slightly wounded it with fine shot, and in the course of a few minutes it returned and attacked a chicken. Numerous cases are on record where it has flown through windows to attack canaries or other cage birds.

An Enemy of Wild Fowls.

In the general character of its flight, as well as the mode of hunting and capturing its prey, it closely resembles Cooper's Hawk, though it frequents the thick woods rather more than the latter bird. In the fall this hawk is common along the smaller water courses where it is very destructive to wild ducks and other water fowl, and is able to strike down a bird as large as a full grown mallard. If its prey is a bird of this size it rarely eats more than the flesh from the breast, leaving the rest of the carcass untouched. Scorning to feed upon carrion, another victim is secured when hunger returns.

A Successful Grouse Hunter.

Of the upland game birds the ptarmigan in the north and the ruffed grouse in the middle districts suffer severely from the attacks of this powerful hawk. Dr. William H. Dall, who found it common in the valley of the Yukon river, states that it feeds largely on the white ptarmigan, the flocks of which it follows from place to place. E. W. Nelson and L. M. Turner both corroborate its destructiveness among these birds. In some parts of the country the Goshawk hunts the ruffed grouse so persistently that it is known by the name of "Partridge Hawk," and this bird probably has no worse enemy except man. As Audubon was passing down the Ohio he observed one of these hawks dive into a flock of grackles which was crossing the river, and kill four or five of them. After giving each victim a fatal squeeze the hawk allowed it to fall to the water and at the close of the chase returned and picked up all from the surface.

COOPER'S HAWK.

The Cooper's Hawk, also known as the Long-tailed chicken or Pheasant Hawk, is a common native. This species and its near relative the Sharp-shinned Hawk are the ones which probably do more

damage to the poultry interests of Pennsylvania than all other of our hawks. Although this hawk is common during all seasons it is much more plentiful during the late spring, summer and early autumn than in midwinter. The Cooper's Hawk measures from eighteen to twenty inches in length; its extended wings measure about thirty-six inches; the long and rounded tail is about eight and one-half inches long. The adult male is a little smaller than the female, to which the above measurements refer. The adults have upper parts bluish-gray, top of head blackish; the tail has several blackish bars; below white; the breast and sides being barred with dusky or rufous." The immature birds are dusk above, more or less spotted with white and reddish brown; tail banded and lower parts white, with long brown spots.

The Nest and Eggs.

Nest building is commonly begun in this locality about the middle of April, and lasts for a period of from three to five days. Occasionally this bird will deposit its eggs in a deserted crow's nest. I believe they prefer to erect their own nests, and, from my observation, am quite positive they only appropriate the nests of other birds when their own have been destroyed. The building of the nest is the conjoint labor of both birds. It is usually built in a thick woods, and when a pair of Cooper's Hawks begin housekeeping in woodland near the farmer's poultry yard, and they are not soon hunted up and killed or their nest and its contents destroyed, the chances are they will destroy a good many dollars worth of poultry before they and their young leave the locality.

Externally the nest is built of sticks varying much in size. It is generally lined with the inner layer of bark, although frequently, blades of grass, feathers and leaves enter into the construction of the interior. The eggs measure about 1.99x1.50 inches and usually number from three to four, although it is not a rare occurrence to find five. In color they are a dull, bluish white. Sets are sometimes taken with numerous and unevenly distributed brown and reddish spots.

The young leave the nest in about 25 days; when about 8 or 9 weeks old they are able to provide food for themselves; to this time, however, they are carefully guarded by the old birds and fed almost entirely on a diet of small wild birds, chickens and an occasional mammal and some insects.

An Audacious Poultry Thief.

While it is true the Cooper's Hawk preys to a much greater extent on full grown poultry than does his daring little relative the Sharp-shinned Hawk, there is no doubt that at times individual Cooper's Hawks are equally as bad about destroying young poultry as are the

Sharp-shinned hawks. For impudent daring this present species, without doubt, ranks pre-eminent among the raptorial genera. Almost every farmer or poultry raiser can give instances of where he or she was the victim of pillage by this bold and audacious robber. In the spring of 1878 the writer was presented by a friend with a Cooper's Hawk which he had caught in a steel trap, but not until he and his mate had destroyed some fifty young chickens. In one day these two hawks killed twelve chickens.

A Varying Diet.

Dr. Coues (Birds of Northwest) says, in speaking of this hawk: "Possessed of spirit commensurate with its physical powers, it preys upon game little if any humbler than that of our more powerful falcons. It attacks and destroys hares, grouse, teal, and even the young of larger ducks * * * besides capturing the usual variety of smaller birds and quadrupeds. It occasionally seizes upon reptiles or picks up insects."

The following quotation from Dr. Fisher's Hawk and Owl Bulletin No. 3, page 39, show how extensively the Cooper's hawk feeds on game and domestic birds. Nuttall says: "His food appears principally to be of various kinds; from the sparrow to the ruffed grouse, all contribute to his rapacious appetite. * * * His depredations among domestic fowls are very destructive." (Land Birds, 1832, p. 90.)

Mr. H. Nehrling says: "This very common and impudent robber is the most destructive of the raptores to the barnyard fowls; in a short time all the young chickens, turkeys and ducks are killed by it." (Bull. Nutt. Ormith. Club., Vol. VII, 82, p. 174.)

Mr. Thomas McIlwaith says: "This is one of the chicken hawks, and it well deserves the name, from the havoc it makes among the poultry." (Birds of Ontario, p. 137.)

Destroying Quail.

Mr. Henshaw informs me that the Cooper's Hawk is a very partial to quail's flesh in California and the southern territories, and that it undoubtedly secures many victims. He once saw a young female dart into a bevy of Gabel's quail and seize one with the utmost ease, though the birds were flying at full speed. In an instant the flock scattered in every direction and sought refuge in the bushes, from which it proved next to impossible to dislodge them. They had recognized their enemy, and evidently knew that their only chance for safety lay in close hiding.

Destroys Pheasants and Other Game.

The common name of "Long-tailed Pheasant Hawk," by which the swift-winged plunderer is best known in the mountainous and

sparsely settled regions is given because of the great damage this hawk does by destroying ruffed grouse. For several years past the writer has every season visited different localities in Pennsylvania, for the purpose of hunting ruffed grouse or pheasant, and from personal observation is well aware that the Cooper's Hawk is a most destructive foe of this noble game bird. Hunters and woodsmen have often told me that these "pheasant hawks," referring to both the Cooper's and Sharp-shinned, kill almost as many birds as the average sportsman, and judging from the way in which a good many sportsmen "shoot" when they are in the brush after the wily grouse, it is very likely that this statement is correct.

The Cooper's hawk feeds upon the gray rabbit (common cotton-tail) and the mountain jack or white rabbit (varying hare). Squirrels are occasionally killed and young wild turkeys also suffer considerably from the attacks of this bird. Besides destroying poultry and game of different kinds, these hawks annually kill great numbers of small wild birds, such as woodpeckers, sparrow, thrushes, etc. The Cooper's Hawk has been known to kill and feed upon the following species of birds and mammals which are present in this State:

Birds.

Ruffed Grouse,	Meadow Lark,
Quail,	Screech Owl,
Common Dove,	Flicker,
Goldfinch,	Red-headed Woodpecker,
Robin,	White-breasted Nuthatch,
Shore-lark,	Song Sparrow,
Tree Sparrow,	Snowbird,
Towhee,	Crow Blackbird,
Red-winged Blackbird,	Field Sparrow,
Wild Turkey,	Savanna Sparrow,
Wood Duck,	Blue Bird,
Yellow-billed Cuckoo,	English Sparrow.

Mammals.

Opossum,	Chipmunk,
Gray Rabbit,	Red Squirrel,
Varying Hare,	Common Rat,
Field Mice,	Woodchuck (young).

SHARP-SHINNED HAWK.

The Sharp-shinned Hawk bears a close resemblance to the Cooper's Hawk, but it can be distinguished from the latter by its smaller size and the end of the tail which is straight or slightly notched. The tip of the Cooper's Hawk tail is decidedly rounded. Length 10 to 14 inches: extended wings 21 to 26.

Adult: Upper parts bluish gray, top of head darker, tail crossed with several blackish bands; lower parts white; breast and sides with dusky or reddish bars. In immature birds the upper parts are dusky more or less spotted with lighter, and under parts are whitish with blackish streaks.

Nests and Eggs.

This extremely daring and spirited little hawk is one of the most abundant of our North American species. It is found in Pennsylvania as a resident, but during the spring and fall migrations—March, April, September and October—it is much more plentiful than at other periods. The nests in this locality, according to my experience, are mostly built in low trees and are made up almost entirely of small twigs. The eggs, mostly five in number, are nearly spherical, white or bluish white, marked with large and irregular splashes or blotches of brown, and measures about 1.46 by 1.16 inches. This hawk occasionally feeds upon insects, mice and reptiles, but the greater portion of its food consists of wild birds and poultry, particularly young poultry.

When a pair of Sharp-shinned or Cooper's Hawks nest in the neighborhood of a farm, where young chickens can be readily captured, they, if not speedily killed, will visit the place almost daily until the young chickens have all been destroyed, and if the hawks are not molested after a few visits to the coops, they seem to become more bold and daring every day.

Fond of Young Chickens.

Nuttall, writing of the Sharp-shinned Hawk says: "In thinly settled districts this hawk seems to abound and proves extremely destructive to young chickens, a single bird having been known regularly to come every day until he had carried away between twenty and thirty." The same writer says he was one day conversing with a planter, when one of these hawks came down and without any ceremony or heeding the loud cries of the housewife, who most reluctantly witnessed the robbery, snatched away a chicken directly before them.

Poultry and Game Destroyed.

This hawk does not by any means devote his attention exclusively to young poultry when he comes about the farm yard, but often may be seen to attack and kill chickens when two-thirds or full grown. Pheasants or ruffed grouse, both old and young, also quail, are destroyed in considerable numbers by Sharp-shinned Hawks. Young rabbits and squirrels are occasionally captured by these hawks, and on one occasion a few years ago a hunter of my acquaintance shot and presented to me a pair of these hawks which had killed several wild turkeys, which he said were about one-third grown. I have known both the Sharp-shinned and Cooper's Hawks,

which had probably been watching coveys of quail, to suddenly swoop down and seize quail which had been shot by gunners, when the sportsman was only a few yards from the quail he had killed or wounded. Doves, which in recent years or since the wild pigeons have disappeared from this region, are eagerly sought after by sportsmen in many sections of the State, are very often destroyed by these hawks; they also sometimes attack the domestic pigeons, and they destroy many meadow larks and thrushes.

Dr. A. K. Fisher, assistant ornithologist, United States Department of Agriculture, in his admirable bulletin No. 3, on the Hawks and Owls of the United States, very properly says: "Little can be said in favor of this hawk, although its daring, courage and impudence are to be admired. On this and the two following species (Cooper's Hawk and Goshawk) mainly rests the responsibility for the ill-favor with which the other hawks are regarded. A score of valuable species suffer because they belong to a class which include two or three noxious kinds. However, like most villains, it has at least one redeeming quality, and that is its fondness for the English sparrow, our imported bird nuisance."

Birds Destroyed.

The Sharp-shinned Hawk is known to kill and feed upon the following species of small wild birds which are common in this State:

Meadow Lark,	Downy Woodpecker,
Common Robin,	Goldfinch,
Crow Blackbird,	Savanna Sparrow,
Cow Blackbird,	Baltimore Oriole,
Blue Bird,	Chickadee,
Flicker,	Hermit Thrush,
Red Eyed Vireo,	Fox Sparrow,
Black Throated Green Warbler,	Chipping Sparrow,
Red-Winged Blackbird,	Orchard Oriole,
Red-headed Woodpecker,	White-throated Sparrow,
Cat Bird,	Brown Thrush,
English Sparrow,	Myrtle Warbler,
Song Sparrow,	Common Pewee,
Tree Sparrow,	Oven Bird,
Snow Bird,	

This list could be considerably enlarged, as there are many other kinds of birds which different observers have identified among the stomach contents of this hawk. The list, is, however, sufficiently large to give the general reader a very clear idea that the Sharp-shinned is ever ready to capture and prey upon almost any bird he can master.



DUCK HAWK.

DUCK HAWK.

This bold and predatory hawk, the largest of the typical falcons found in this region, retires usually during the summer time to the mountainous districts, generally in the neighborhood of large streams, and in the winter season it is found as an irregular visitor in nearly all sections of our Commonwealth. The species breeds regularly but sparingly in Pennsylvania.

Kills Fowls and Wild Birds.

This hawk, like the Cooper's and Sharp-shinned species previously mentioned, is detrimental, but fortunately for the farmer and sportsman, the Duck Hawk is a comparatively rare bird, and, except in winter, is found usually about the larger rivers. However, when a pair of these birds begin house-keeping on a high rocky ledge in the neighborhood of farm houses, they frequently destroy a good many domestic fowls.

Two years ago, in midwinter, a farmer living along the Brandywine creek, near West Chester, brought to my office two of these hawks which he had killed one evening at his carp pond where, he stated, they went to catch his ducks and chickens. He said that this pair of hawks had killed eight chickens and three ducks for him in about a week.

Dr. C. H. Merriam (Birds of Conn.) referring to a Duck Hawk which was shot on Falkner Island, Connecticut, says: "During her brief visit she had made sad havoc among the terns, and her crop was greatly distended with their remains which had been swallowed in incredibly large pieces; whole legs and long bones of the wings were found entire and unbroken. Indeed, she was perfectly gorged and contained the remains of at least two terns, besides a mass of newly hatched young."

Concerning the habit this species has of destroying ducks and other game birds Audubon says: "He pursues the smaller ducks, water hens, and other swimming birds; and, if they are not quick in diving, seizes them, and rises with them from the water. I have seen this hawk come at the report of a gun, and carry off a teal not thirty steps distant from the sportsman who had killed it, with a daring assurance as surprising as unexpected. This conduct has been observed by many individuals, and is a characteristic trait of this species. The largest bird I have seen this hawk attack and grapple with on the wing is the Mallard.

"The Duck Hawk does not, however, content himself with water fowl. He is generally seen following the flocks of pigeons and even blackbirds, causing great terror in their ranks, and forcing them to perform aerial evolutions to escape the grasp of his dreaded talons. For several days I watched one of them that had taken a particular fancy to some tame pigeons, to secure which it went so

far as to enter their house at one of the holes, seize a bird, and issue by another hole in an instant, causing such terror among the rest as to render me fearful that they would abandon the place. However, I fortunately shot the depredator. They occasionally feed on dead fish that have floated to the shores or sand-bars."

PIGEON HAWK.

This little falcon breeds chiefly north of parallel 43°, though, as Dr. Fisher adds, "in the mountains it extends south of this latitude, and in the mountains of some of the West India islands it is a summer resident." I have observed this hawk only as a visitor during the spring, fall and winter months. Future investigations, however, may show that, as some assert, it occurs as a native in some of our higher mountainous districts.

A Destructive Species.

Field observations and post-mortem examinations made by numerous naturalists show very conclusively that, although the Pigeon Hawk, will sometimes destroy poultry, tame pigeons and even game birds as large as the ptarmigan, it preys mainly on various kinds of small wild birds. It sometimes catches insects and small quadrupeds and at times it will, when pressed for food, feed on offal.

In the stomachs of fifty-one of these hawks examined by Dr. A. K. Fisher, forty-one contained small birds, and of these the following species were identified:

Song Sparrow,	Swift,
English Sparrow,	Flicker,
Indigo Bird,	Warblers,
Field Sparrow,	Bobolink,
Swamp Sparrow,	Tree Swallow,
Chipping Sparrow,	Red-eyed Vireo,
Goldfinch,	Brown Creeper,
Thrush,	Solitary Vireo.

BARRED OWL.

The Barred Owl is readily distinguished from other species by its large size, yellow-colored bill and its black eyes. Barred Owls are exceedingly abundant in many of the southern States, where they are known by the names of "Hoot" and "Swamp Owls." In Pennsylvania this owl is found throughout the year, and in many of the mountainous and heavy-wooded regions; it is the most common of all the owls. The Barred Owl lays its eggs in a hollow tree, or in the deserted nest of a hawk or crow; the white eggs are a little under 2 inches long by about 1 $\frac{3}{4}$ inches wide. The Barred and Great-horned Owls are the only species, in this locality, whose depredations to poultry and game are worthy of note. Unfortunately, however, the hatred towards these two birds, and particu-



PIGEON HAWK.

lary the enmity against the Great Horned Owl has brought all our owls in bad favor; the farmer's boy and sportsmen, with few exceptions, let no opportunity pass to pillage an owl's nest or slay its owners.

In this way, there are annually destroyed large numbers of Screech, Long-eared and Short-eared owls simply because the popular idea is that all owls, large and small, prey only on poultry and game.

The Barred Owl preys to a limited extent on poultry; he destroys a good many grouse and various species of small wild birds. He also catches mice and rabbits. Frogs, crawfish and some insects are also devoured by this bird. I am quite confident that Audubon was entirely correct in the statement that this owl often catches fish, as I have several times been informed by reliable persons that they have seen the Barred owl catch fish. Some few years ago a Barred owl was seen in the act of catching a large brook trout at the State Hatchery, at Allentown, Pa. In the winter of 1885, I was informed by two residents of Florida, both gentlemen whom I consider thoroughly trustworthy, that this bird frequently preys on fish, which it secures while sitting close to the water's edge, by a dexterous movement of the foot.

HORNED GREBE.

This species is recorded as quiet a common winter resident throughout the United States, and although sometimes found nesting within our northern limits, it retires chiefly north of the United States during the breeding period (middle of May to middle of August.) Audubon (*Birds of America*) states that he found in Ohio, near Lake Erie, in the month of July, nests containing eggs in which incubation was well advanced. Dr. Coues (*Birds of the Northwest*) mentions that he has found it breeding at various points in North Dakota, where in June and July he secured both eggs and young, the latter newly hatched. This species is recorded by Dr. E. A. Samuels as nesting in more northern latitudes than New England.

The Horned Grebe is an irregular sojourner in Pennsylvania from the middle of October until early in April. In the months of March and April this diver is usually more numerous than at other times during its residence with us. Although generally observed singly or in pairs, and sometimes in parties of four, five or six, I have seen, on three occasions, in the past ten years, flocks numbering from twelve to twenty-five of these birds, during the spring migrations, on the Susquehanna, Lehigh and Delaware rivers. Dr. Walter Van Fleet and Burgess J. H. Ferguson, both of Renovo, Clinton county, Pa., recently informed me that in the latter part of March or early in April, 1894, large numbers of Horned Grebes appeared in various streams and ponds in Central Pennsylvania and remained for two or

three days before passing northward. Mr. Ferguson says there were at least two hundred Grebes in the river at Renovo, where many were killed by gunners. In a small pool, less than one rod across, Dr. Van Fleet secured over twenty. Audubon, writing of the food of Horned Grebes, says: "I have observed in the stomachs of almost all I have examined a quantity of hair-like substances rolled together like the pellets of owls, but have not ascertained whether or not these masses are disgorged. The food of this species, while on salt water, is composed of shrimps, small fish and minute crustacea. While on fresh water they procure fish, insects, leeches, small frogs, tadpoles and aquatic lizards; they also pick up the seeds of grasses."

The stomach-contents of nine of these birds which I have examined consisted mainly of sand, remains of fish, beetles and frogs and portions of green-colored aquatic plants. In the stomachs of three specimens I have found in addition to other food-stuffs, small ball-like masses of feathers.

DABCHICK.

The Pied-billed Grebe, or Dabchick, is a common spring and fall visitor, and in winter it is often seen, especially in the southern counties of the State. The Dabchick is the only one of the Grebes which has been known to naturalists, with whom I have corresponded on the matter, to breed in Pennsylvania, but as a native the bird is rare, or if it breeds at all regularly with us, it retires to such secluded situations that collectors rarely find it. In the counties of Crawford and Erie, Mr. Geo. B. Sennett has observed the species as a "moderately common spring and fall migrant," and Mr. August Koch, of Williamsport, has noted it in his locality, only as spring and fall visitor. Dr. John W. Detweiler, naturalist, residing at Bethlehem, Northampton county, writes me he has found it breeding in Pennsylvania.

Prof. H. Justin Roddy, of the Millersville State Normal school, says: This Grebe about ten years ago bred in Perry county, Pennsylvania. The following interesting and valuable notes concerning the nesting habits of the Pied-billed Grebe are given by Mr. Langdon in his list, Summer Birds of a Northern Ohio Marsh: "The little floating island of decaying vegetation held together by mud and moss, which constitutes the nest of this species, is a veritable ornithological curiosity. Imagine a 'pancake' of what appears to be mud, measuring twelve or fifteen inches in diameter, and rising two or three inches above the water, which may be from one to three feet in depth; anchor it to the bottom with a few concealed blades of 'sawgrass,' in a little open bay, leaving its circumference entirely free; remove a mass of wet muck from its rounded top and you expose seven or eight soiled brownish-white eggs, resting in a de-

pression, the bottom of which is less than an inch from the water; the whole mass is constantly damp. This is the nest of the Dabchick, who is out foraging on the marsh, or perhaps is anxiously watching us from some safe corner nearby.

"The anchoring blades of coarse saw-grass or flags, being always longer than is necessary to reach the bottom, permit of considerable lateral and vertical movement of the nest, and effectually provide against drowning of the eggs by an ordinary rise in the water-level such as frequently occurs during the prevalence of strong easterly winds on the lake. A small bunch of saw-grass already growing in a suitable situation is evidently selected as a nucleus for the nest, and the tops bent so as to form part of it.

"During the day we invariably found the eggs concealed by a covering of muck as above described; but, as we ascertained by repeated visits at night and in the early morning, they are uncovered at dusk by the bird who incubates them until the morning sun relieves her of her task."

THE LOON OR GREAT NORTHERN DIVER.

This bird, the largest of all the divers, is about as large as a medium-sized domestic goose. The Loon, known to many as the Great Northern Diver, is a regular and tolerably common spring and fall migrant, frequenting, principally the rivers, larger streams and lakes. In the winter, when streams and other bodies of water are not frozen over, individuals of this species are frequently to be found with us. Although not known to breed in Pennsylvania, these birds are sometimes seen here in the breeding season.

Hon. N. F. Underwood, of Lake Como, Wayne county, and hunters living in Wyoming and Susquehanna counties, have informed me that solitary Loons are occasionally to be found throughout the summer months, inhabiting the numerous small lakes in the northeastern parts of this Commonwealth. In Lycoming county, Mr. August Koch says, "the Loon is a common visitor, oftener to be noticed in the spring than in the fall, and occasionally single birds may be noticed in the summer months." The Loon ever cautious and vigilant, will dive at the flash of a gun and proceed under the water to a very considerable distance before reappearing. These birds, it is said, when endeavoring to evade their enemies, and also at times when in quest of food, swim under the water with greater rapidity than they fly through the air. Writing of the Loon Nuttall says, in referring to its voice: "Far out at sea in winter, and in the great western lakes, particularly Huron and Michigan, in summer, I have heard on a fine, calm morning, the sad and wolfish call of the solitary Loon, which, like a dismal echo, seems slowly to evade the ear, and rising as it proceeds, dies away in the air. This boding sound to mariners, supposed to be indicative of a storm, may be heard some-

times for two or three miles, when the bird itself is invisible, or reduced almost to a speck in the distance."

The stomach-contents of seven Loons, captured during the winter months in Chester, Delaware, Clinton and Lehigh counties, Pa., consisted entirely of fish bones and scales; two other specimens, purchased in the winter of 1881 from a game dealer in Philadelphia, were found to have fed on small seeds and portions of plants, apparently roots. Individuals of this species are, it is said, sometimes found in the Hudson Bay region weighing as much as fifteen or sixteen pounds apiece. The female is somewhat smaller than the male. The weight of three females taken in Pennsylvania in the early spring ranged from seven to seven and three-quarters pounds each, and two males, one taken on the Lehigh river, in the fall, the other captured in Warren county, on the Allegheny river, in the spring, tipped the scales each time at nine and three-quarter pounds.

THE BLACK-CROWNED NIGHT HERON.

Next to the Green Heron the Night Heron is unquestionably the most abundant of the family in this State. The adult birds are easily distinguished from other herons by the black feathers on top of head and back, red eyes, and frequently three long, fine white feathers, which grow from the base of the head. The appellation, Night Heron, is highly appropriate, as the bird is strictly nocturnal in its habits. During the daytime the Night Heron is inactive, and generally is found perched on a log or the limb of a tree in a quiet nook about the swamps and streams. As twilight approaches, this drowsy wader becomes, as it were, a new being, impelled, no doubt, by the pangs of hunger; he stands erect, the loose and shaggy plumage, which before seemed ill adapted to his body now fits neat and closely as he carefully walks to the extremity of the dead and decorated limb on which he has been dozing, and suddenly with a loud squak launches himself into the air, uttering at short intervals his harsh note, and, rising above the trees in the forest, he speedily visits some mill-dam. These birds arrive in Pennsylvania about the 25th of April and remain until the latter part of September. They seem to repair at once on their arrival in spring to localities where they are accustomed to breed. After the breeding season, i. e., about the middle of August, when the young are amply able to provide for themselves, these birds forsake their nesting places and become quite plentiful along the rivers, streams and bushy marshes.

The Night Heron rarely, if ever, breeds singly, but always in large companies. I have visited, on different occasions, two of these breeding resorts and found from twenty-five to seventy-five nests, which like most of the other species, were built of stick and placed usually in high trees. In Berks county, near Blue Rock, for many years this species annually reared their young in the edge of a

large woods along the margin of which there was a good-sized stream. In this place many of the nests were built in a bunch of saplings, some fifteen or twenty feet high and so small in diameter that it was impossible to climb them.

Wilson has very properly said that the noise of the old and young in one of these breeding places would induce one to suppose that two or three hundred Indians were choking and throttling each other. The same writer in referring to examinations which he made, states that the teeth of the pectinated claw were thirty-five to forty in number, and, as they contained particles of the down of the bird, showed evidently from this circumstance that they act the part of a comb to rid the bird of vermin in those parts which it cannot reach with its bill. The late Isaac G. Darlington, of West Chester, some years ago had large numbers of gold fishes in a pond near his residence. One day Mr. Darlington caught twenty-five of these fish and placed them in a small pool, intending to remove them the following morning. "About bedtime," Mr. D. said, "I heard a loud squawking, and on going out saw two Night Herons actively engaged in catching these fish.

"I shot one of these robbers, which you there see mounted, on the bookcase, and on making an investigation found only one of the fish remaining."

"An accident may illustrate the habits of the Night Heron, and perhaps of the whole family. A Night Heron had been noticed for several days sitting on a tree near a branch of White Clay creek. It was at length shot and brought to me, with the tail of a large fish projecting four inches beyond its bill. On removing the fish (a sucker *Catostomus*, which must have been twelve inches long), its head and shoulders, except the bony portions, were eaten away by the gastric liquor of the stomach."—Michener.

I have examined the stomachs of twenty odd of these herons, adult and young, which have been shot in June at the breeding grounds, and found in all only the remains of fishes. In two or three immature birds, taken in August and September, I have discovered a few grasshoppers and portions of insects.

BELTED KINGFISHER.

Kingfishers are common along our rivers, streams and ponds, about which they are found at all seasons, unless forced to migrate southward by excessively cold weather. The loud and harsh cry of this bird, as Wilson has properly stated, is not unlike the noise made by twirling a watchman's rattle. "It is uttered while moving from place to place, always on being disturbed, and even sometimes when he is about to plunge into the water for fish. But especially

is it heard at night when the male bird is returning to the nest with food for his mate and young."—Gentry.

Their eggs are deposited in holes which they excavate in sides of banks, usually about the streams and ponds they frequent. On several occasions I have discovered their nests in high embankments along public roads, railroad cuts and old quarries. The excavations vary greatly in depth, but average four or five feet; occasionally you find one straight; commonly, however, they are directed to the right or left of the main opening and terminate in quite a large cavity. The eggs (1.30 by 1.06 inches) are white and usually six in number, although I have seen, in several instances, seven. The eggs, according to my observation, are invariably deposited on the bare earth. Mr. Gentry, however, tells us that he has "in many instances known them to be deposited in a warm and cosy nest constructed of dried grasses and feathers."

Kingfishers feed almost entirely on fish. Their proficiency in catching small fish is such that they are in bad repute among the owners and proprietors of trout and carp ponds. Two gentlemen of my acquaintance were so greatly annoyed by the loss of gold fish and trout, which had been sustained from the regular visits of several pairs of these birds, that they adopted the following means for their destruction: Stakes were driven about the ponds in several places; the tops of the stakes were sufficiently large to support steel traps which were set but not baited. The birds on visiting the ponds would invariably fly to one of the stakes and alight. In less than one week, ten or twelve kingfishers were in this way trapped and killed. A friend, some few years ago, informed me that he caught one of these birds on a hook and line while fishing in the Brandywine, near Chadd's Ford. My informant said he had a live bait (minnow) on his hook, and he was winding up his line on the reel, when he saw a kingfisher plunge into the water at his bait, which it not only caught, but at the same time hooked and entangled itself so that it could not escape.

One day Mr. B. M. Everhardt, of West Chester, Pa., found a kingfisher lying on the bank of a small stream. On making an investigation, Mr. Everhart ascertained that the bird was unable to fly, as its bill was tightly clasped in the grasp of a large fresh-water mussel. I have heard of two or three instances where kingfishers have been captured under similar circumstances, which would naturally lead one to suppose that they feed to a limited degree on the flesh of these bivalves. According to certain writers, this species is said to feed occasionally, though rarely, on insects. Mr. E. A. Samuels states that he once shot a kingfisher which had just seized a mouse.

The writer has examined the stomach-contents of thirty-eight of these birds which have been taken about streams and mill-ponds of this State during the past ten years. Thirty-six stomachs con-



BLUE JAY

tained only the remains of fish; one bird had, in addition to small brook trout, a large water beetle in its stomach. The viscera of the remaining kingfisher was empty.

Mr. C. K. Sober, of Lewisburg, Pa., found in the viscera of a single kingfisher which he shot along Baker run, a famous brook trout stream in Clinton county, no less than thirteen small trout fry. Mr. Sober, as well as many other sportsmen, who are familiar with the habits of the kingfisher, assert that these birds destroy immense quantities of trout.

It is a fact well known to every man who does much trout fishing along our mountain streams, that Kingfishers are almost always to be observed in no small number about such places, and as they are voracious feeders there can be no question but what they will, during their sojourn in such places, commit great havoc to trout or other fish.

Some years ago an acquaintance of the writer had a pond in which he had a large number of gold fish. Two pairs of Kingfishers had their nests in a sand quarry near the pond. These birds in one summer made daily visits to the pond and destroyed nearly all the small-sized fish in the place.

The disposition on the part of a large number of the citizens of this State in favor of bounties for the heads of different birds and mammals, is very marked. There are unquestionably several species of hawks and owls and a few mammals which do much damage to the agricultural and game interests. Unfortunately, however, there is so little attention paid by the masses to the subject of birds and mammals that when bounty acts are passed it usually happens that great numbers of beneficial species are slain because the hunters are unable to distinguish one species from another. In the early part of February last a circular was sent out by the Game Commission to sportsmen throughout the State. Among the questions asked was the following:

"Are you in favor of a bounty on the Kingfisher?"

In reply to this question it was learned from about sixteen hundred answers received that fully one thousand persons who replied to the query favored a bounty for this bird. A number of the correspondents claimed that Kingfishers destroyed great numbers of brook trout as well as other fish.

BLUE JAY.

The Blue Jay is found in Pennsylvania during all seasons of the year, but in the autumn and summer months this species is much more plentiful than at other periods. This beautiful bird is an inhabitant chiefly of forests. During the breeding season the Jays associate in pairs, but in the late summer and autumn it is not unusual to find them in small flocks. I have seen on several occasions

as many as twenty-five of these birds feeding in beech, chestnut or cedar trees. Both sexes engage in nest-building, which, in this latitude, is begun about the 20th of April. A nest which I saw the birds building was completed in five days. The nest, a strong bulky structure, composed chiefly of twigs and fine roots, is placed commonly in a tree in the woods; sometimes, though rarely in this locality, nests are built in low bushes. The eggs, four to six in number, mostly five, are greenish or brownish-gray, spotted with brown. Length about 1.15 inches, width .84 of an inch. In Florida the Blue Jay nests some five or six weeks earlier than in this latitude; at least I suppose this to be the case, as I have seen these birds collecting sticks, etc., as early as the first week in March.

In reference to the food of this species, Mr. E. A. Samuels writes as follows: "Its food is more varied than that of almost any other bird that we have. In winter the berries of the cedar, barberry or black-thorn, with the few eggs or cocoons of insects that it is able to find, constitute its chief sustenance. In early spring the opening buds of shrubs, caterpillars and other insects, afford it a meager diet. Later in the spring, and through the greater part of summer, the eggs and young of the smaller birds constitute its chief food, varied by a few insects and early berries. Later in the summer, and in early autumn, small fruits, grains and a few insects afford it a bountiful provender; and later in the autumn when the frosts have burst open the burs of chestnuts and beechnuts and exposed the brown ripe fruit to view these form a palatable and acceptable food, and a large share of these delicious nuts fall to the portion of these busy and garrulous birds."

The Blue Jay is a notorious destroyer of bird's nests; while the eggs and young of the smaller species which nest in trees are usually attacked by the robber-jays, they often hunt out and despoil the homes of ground nesting species. The eggs and young of pheasants are frequently destroyed by Jays. While it is true that the Blue Jay destroys a good many noxious insects, there is no doubt but what this bird does a great deal of harm by devouring the eggs and young of numerous beneficial song and insectivorous birds. Like the crow and common blackbird the Blue Jay occasionally repairs to shallow water to catch small fish on which it will feed. Some years ago Mr. C. K. Sober, a member of our Game Commission, was fishing for trout along one of the streams in Centre county, when he saw a Blue Jay along the water's edge trying to catch fish. A few minutes after seeing the bird Mr. Sober hooked a small-sized trout and caught his line in a bush; and when he was endeavoring to untangle his line he was surprised to see the Jay fly down to the bush where the hook, line and fish were caught, and seize the trout and endeavor to carry it away.

Audubon writing of the Blue Jay says: "It robs every nest it can find, sucks the eggs like the crow, or tears to pieces and devours the young birds. A friend once wounded a pheasant and marked the direction which it followed, but had not proceeded two hundred yards in pursuit, when he heard something fluttering in the bushes, and found his bird belabored by two Blue Jays who were picking out its eyes. The same person once put a flying squirrel into the cage of one of these birds, merely to preserve it for one night; but on looking into the cage about eleven o'clock next day he found the mammal partly eaten. A Blue Jay in Charleston destroyed all the birds in an aviary."

MAMMALS WHICH EAT FISH.

Wild cats, raccoons and muskrats all, it is claimed, catch fish, yet the damage they do in this direction does not, from reports at hand, appear to be worthy of particular notice.

The greatest damage done by muskrats seems to be caused by the injury to dams and fish ponds caused by their subterranean passages, rather than to their fondness for the flesh of the finny inhabitants. The food of the muskrat is, from the writer's observation, chiefly of a vegetable character. In fact numerous reports are on file in the writer's possession, showing that in some portions of our State muskrats do considerable damage every year to corn and other crops in the vicinity of the streams and ponds which they inhabit.

The Mink and Otter, however, are both great devourers of fish, and the former unquestionably is a serious hindrance at times to fish culture.

The Otter, chiefly piscivorous in habit, does comparatively little damage because there are so few of these shy and valuable fur-bearing animals within the limits of our State. According to the statements of various fur dealers in this Commonwealth, not over fifty otters are annually captured in Pennsylvania.

THE MINK.

It is not a pretty animal with its long, low, flat head, small eyes, ears so tiny as to be hardly longer than the fur, with stiff, strong bristley whiskers, which grow not only in the ordinary way, but behind the eyes, middle of shin, and on wrists and ankles. His snout, devoid of hairy covering, is prominent and inquisitive and his feet are semi-palmate and broad, with palms and soles furry around the pads. His body long and rat-like, covered with "densely soft and matted fur, is mixed with long, stiff and lustrous hairs." This covering is sometimes a light yellowish brown and changes from this to a rich blackish, chocolate brown (or black.) A patch of white usually occupies its under jaw, and occasionally we find such patches on its under parts, and in rare cases the tip of its bushy and somewhat tapering tail is white.

'Tis a wonderfully strong animal considering its weight, which averages in an adult two pounds. Water is as much its home as the land, and its depredations in both are of great annoyance and grievance to fishermen and farmers alike. How they are disliked by the farmers. The mountain streams are sources of vast revenue to these pests, for the pretty, gamey trout yield up their lives in number to them, proving Mr. Mink to be an epicure.

His home is usually to be found along streams and marshy grounds and his voracious appetite is helped to partial satisfaction by the birds which inhabit such haunts and which nest on and near the ground. He doesn't confine himself to birds and fish alone, but reptiles are one of the courses of his long continued and frequently taken meals. Some fifty letters from different parts of Pennsylvania tell of his nocturnal wanderings, so disastrous to the poultry yards. Twenty chickens in one night seems a good many, but from Hon. A. L. Martin, Lawrence county, we hear of a mink (a black one by the way) who made way with thirty-seven chickens, eight weeks old, in one night. Mr. L. C. Oberlin, of Indiana county, writes that they will in one night kill as many as forty chickens and turkeys; and numerous are the complaints and many are the demands for bounties on these miserable, blood-thirsty creatures. They cut the throats of their prey, suck the blood and in many cases leave the bodies uneaten. A letter from S. S. Thomas, Susquehanna county, shows their neatness and cleverness. The continued disappearance of a number of catfish caused their whilom owners to investigate carefully for the cause and piled up under a log he discovered the bodies of twenty of the missing fish. A trap caught the miscreant and ended the thefts.

Eggs he eats wholesale and wholly, not sucking them, but taking them in their entirety. Minks are not without their use, however, for their fine, soft thick fur has its market value and in consequence he is much sought after by fur-dealers.

NOTES ON FOOD OF MINKS.

The following extracts concerning the fish-eating habits of the Mink are taken from letters received by the writer from farmers, fishermen and naturalists residing in various sections of Pennsylvania.

M. R. PIEPSON, DYSERT, PA.:

Minks destroy an immense amount of trout here. They catch them after they run them under a stone or log, when they have them cornered. I, on one occasion, trailed a mink that caught from fifteen to twenty trout in one night and eat part of each.

MR. A. W. RHOADS, WILKES-BARRE, PA.:

I have personal knowledge of the catching of fish by Mink and raccoon; they dive for them in shallow waters.

MR. ARTHUR MARTIN, SANDY LAKE, PA.:

Minks have killed some fish for us in ponds.

HON. GERARD C. BROWN, YORKANA, PA.:

Minks are still around brooks and are good fishers. A Mink won't take long to clean out a small trout pond.

HON. JOHN M. BUCKALEW, FISHING CREEK, COLUMBIA CO., PA.:

Minks destroy fish; sink down in the water to catch and come up to the surface to consume. Minks are numerous and a damage to the communities where found.

MR. SAMUEL M. DOWNS, MAUCH CHUNK, PA.:

I have no personal knowledge, but reports of the mink depredations to fish are common; having a semi-palmated foot and being expert swimmers and divers, they experience little difficulty in capturing the prey.

MR. FRED. F. WELD, SUGAR GROVE, WARREN COUNTY, PA.:

I have occasionally seen dead fish along Stillwater creek, killed and partially eaten by Minks, but have never observed their method of capture.

MR. E. W. CAMPBELL, WEST PITSTON, LUZERNE CO., PA.:

Trout have been killed by Minks, as they have been caught at it.

MR. H. C. KIRKPATRICK, MEADVILLE, CRAWFORD CO., PA.:

I have only seen the Mink fishing once. When duck shooting in Conneaut Marsh, I noticed a great commotion in the water just beneath an oak tree which overhung the water. Thinking it might be a wood duck, I made a large circle and came out under the tree; crawling up to where I could look over the bank I saw a large Mink about ten feet from me; it seemed to be hunting in the weeds for something; in a moment it disappeared under the water; in about fifteen or twenty seconds it reappeared with something in its mouth and swimming to shore jumped out on the bank where it shook it as a dog shakes a rat. After it was apparently dead the mink dropped it and sniffed around it a few times and disappeared in the underbrush. Then I went to where the object was lying and found it to be a large species of Salamander about one foot long. Although they are not a fish it illustrates to a certain extent the mink's manner of fishing for that kind of game.

OTTO BEHR, LOPEZ, SULLIVAN COUNTY, PA.:

Minks are very good fishers. Saw one come out of an open riffle in winter with a large trout in its mouth which it had caught across its back; on another occasion I caught one dragging a good-sized eel along in the snow. They sometimes get into chicken coops and kill a dozen or more fowls in a single night.

W. J. STULL, COALPORT, CLEARFIED CO., PA.:

Mr. Thomas Millen informs me that a Mink has taken quite a number of fish from his fish pond by diving or plunging after them.

PAUL SWINGLE, SOUTH CANAAN, WAYNE COUNTY, PA.:

Minks are very destructive to fish; they swim through the water and catch them.

S. S. THOMAS, LYNN, SUSQUEHANNA COUNTY, PA.:

A few years ago I had a large number of catfish and one eel in a box in my spring drain. Their continual disappearance (the eel among the rest) surprised me, but I one day discovered as many as twenty of the bull-heads (catfish) piled up under a log nearby. A steel trap stopped the theft and added half a dollar to the youngster's pocket money in the way of Mink bounty.

ZIBA SCOTT, SPRING BROOK, LACKAWANNA CO., PA.:

The Mink likes fish; brook trout suits him best if he can get them. He is an expert swimmer; goes under the water and catches them easily. I have shot two within the past year with trout in their mouths. The last one had a trout eight inches long.

C. P. MOTT, MILFORD, PIKE CO., PA.:

Minks undoubtedly kill many fish.

CEARY C. BELL, MAPLEWOOD, WAYNE CO., PA.:

A Mink got into a carp pond last winter and destroyed a great many carp, some of which were nearly two feet long.

J. B. OVIATT, NORWICH, McKEAN CO., PA.:

Have often seen where Minks have caught fish in winter time and have brought them on shore and eat or hid them. Minks have no trouble in catching fish when the water is low.

J. C. HEYLER, NAUVOO, TIOGA COUNTY, PA.:

Minks destroy poultry and birds, but the greatest damage done by them is to brook trout, which is their principal living; they also catch other fish, but trout is their favorite fish diet.

H. C. DORWORTH, OIL CITY, VENANGO CO., PA.:

Have seen a Mink catch a trout in one of our neighboring streams, in the winter, by diving under the overhanging bank (where the trout

usually stay in winter) and catch the trout as they attempted to swim past him. Minks, two years ago, killed all the carp, forty in number, in a pond in Sage run. As these fish work down into the mud in winter, the minks had no difficulty in catching them.

GEORGE FRANC, ARIEL, WAYNE CO., PA.:

The Mink destroys fish, particularly brook trout, and he is also very destructive to domestic fowls, especially chickens.

EMIL ULRICH, STROUDSBURG, MONROE CO., PA.:

Minks destroy fish, particularly brook trout, and they usually catch the largest ones they find in the deep holes.

JOHN KELLOW, CARLEY BROOK, WAYNE CO., PA.:

Minks are at home under the water where they readily capture fish. They annually destroy great numbers of trout.

W. R. PARKS, ATHENS, BRADFORD CO., PA.:

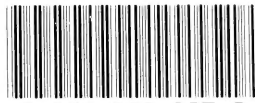
Minks are expert fishermen. They kill large numbers of trout. I once shot a Mink with a large trout in its mouth.

From these quotations it will be seen that Minks unquestionably are great destroyers of fish. While it is well known that they will catch and feed upon almost any species of the finny tribe which they can secure, these amphibious animals have, there is little doubt, a preference for the toothsome and beautiful brook trout. The number of trout which Minks annually kill about our mountain streams is no doubt considerable.





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